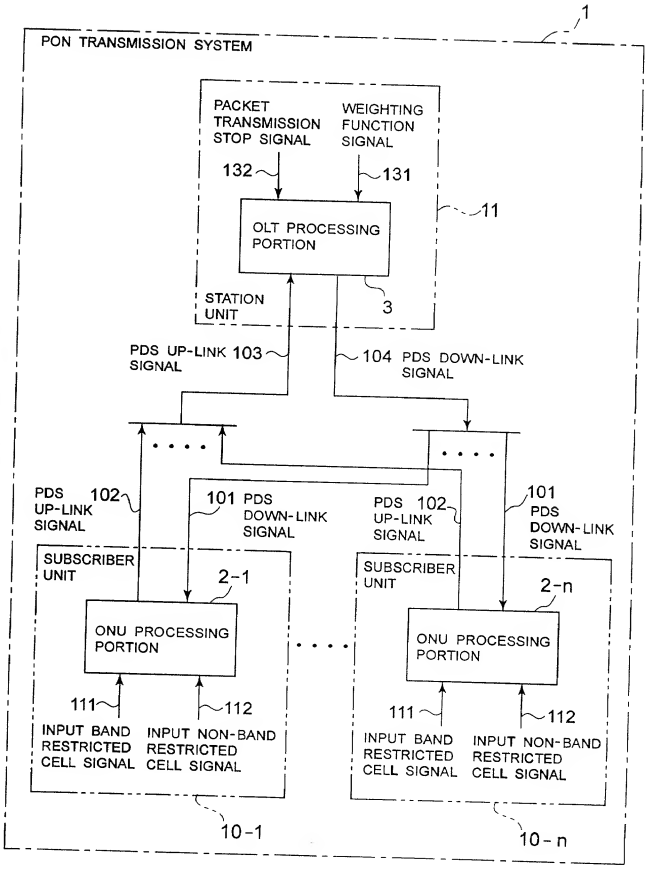
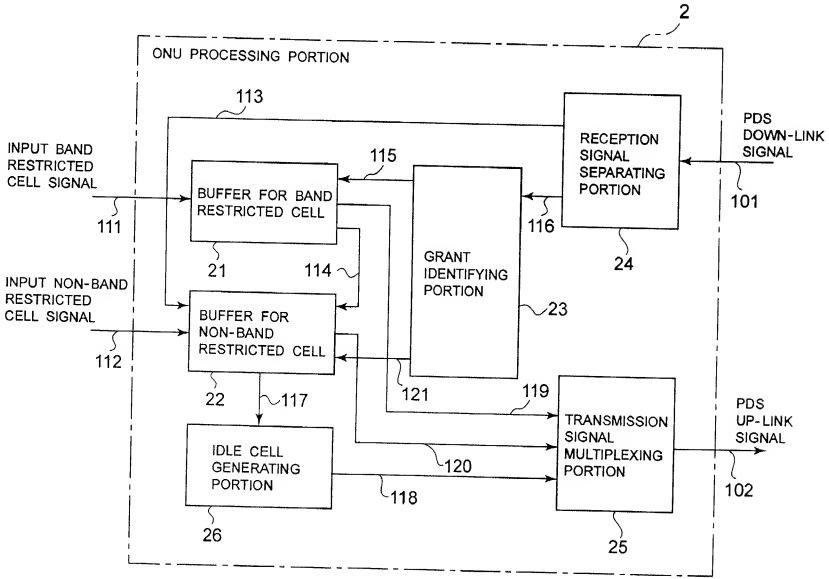
FIG.1


1
PON TRANSMISSION SYSTEM
PACKET TRANSMISSION STOP SIGNAL
WEIGHTING FUNCTION SIGNAL
132
131
11
OLT PROCESSING PORTION
STATION UNIT
3
PDS UP-LINK SIGNAL
103
104
PDS DOWN-LINK SIGNAL
PDS UP-LINK SIGNAL
102
101
PDS DOWN-LINK SIGNAL
PDS UP-LINK SIGNAL
102
101
PDS DOWN-LINK SIGNAL
SUBSCRIBER UNIT
2-1
ONU PROCESSING PORTION
111
112
INPUT BAND RESTRICTED CELL SIGNAL
INPUT NON-BAND RESTRICTED CELL SIGNAL
SUBSCRIBER UNIT
2-n
ONU PROCESSING PORTION
111
112
INPUT BAND RESTRICTED CELL SIGNAL
INPUT NON-BAND RESTRICTED CELL SIGNAL
10-1
10-n

09750775 .011701

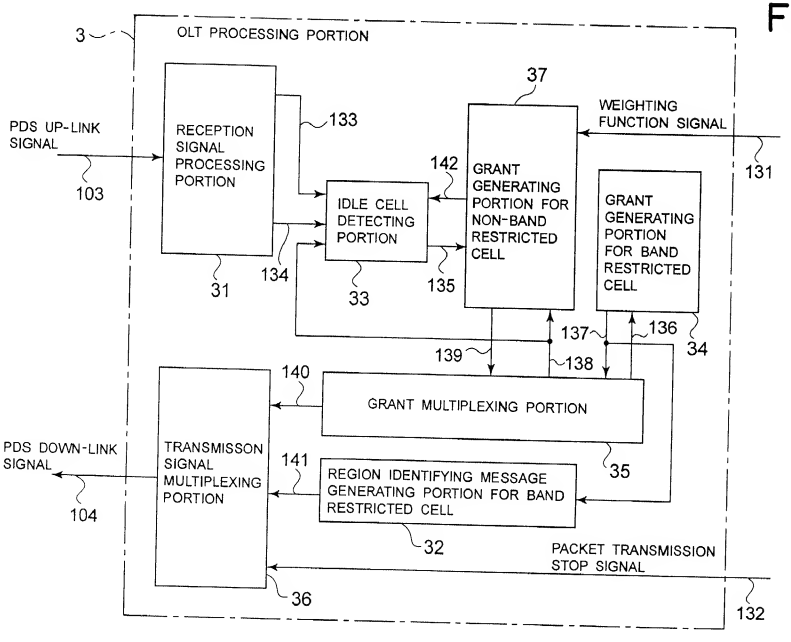
FIG.2



Naoki SAIKUSA
"Pon Transmission System..."
Q62722
Filed January 17, 2001

09760775 .011701

FIG.3



Naoki SAIKUSA
"Pon Transmission System..."
Q62732
Filed January 17, 2001
3 / 25

FIG. 4

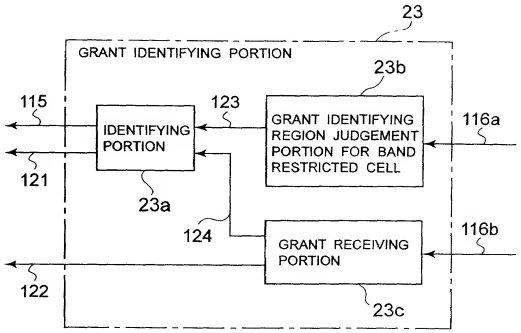

23
GRANT IDENTIFYING PORTION
23b
115
123
IDENTIFYING PORTION
GRANT IDENTIFYING REGION JUDGEMENT PORTION FOR BAND RESTRICTED CELL
116a
121
23a
124
GRANT RECEIVING PORTION
116b
122
23c

FIG. 5

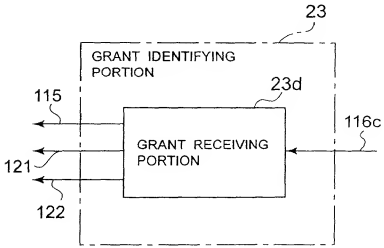

23
GRANT IDENTIFYING PORTION
23d
115
116c
GRANT RECEIVING PORTION
121
122

FIG. 6

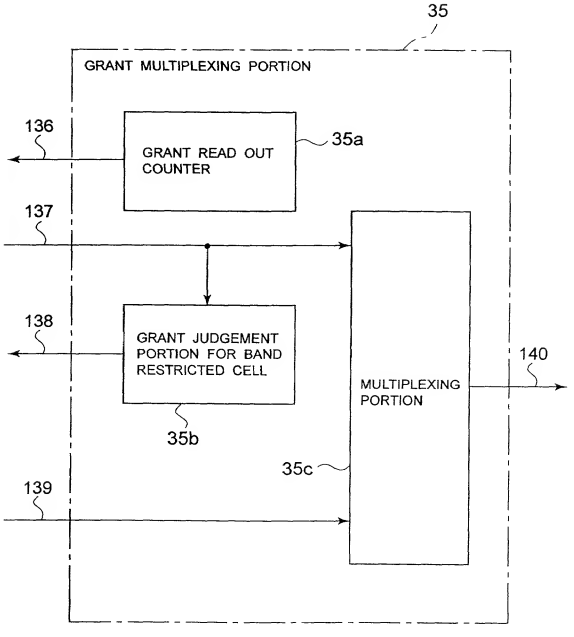

35
GRANT MULTIPLEXING PORTION
136
GRANT READ OUT COUNTER
35a
137
138
GRANT JUDGEMENT PORTION FOR BAND RESTRICTED CELL
35b
MULTIPLEXING PORTION
140
35c
139

FIG. 7

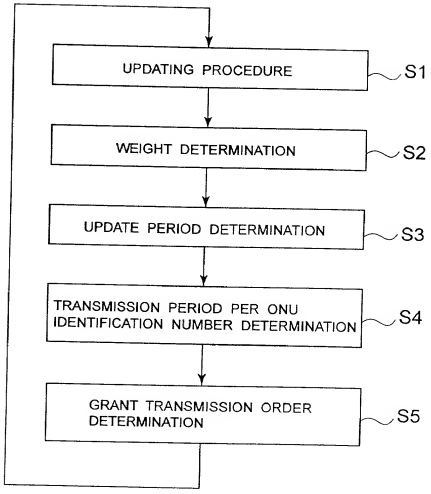
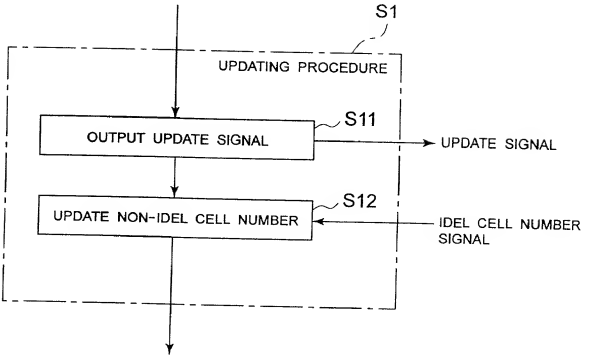

UPDATING PROCEDURE
S1
WEIGHT DETERMINATION
S2
UPDATE PERIOD DETERMINATION
S3
TRANSMISSION PERIOD PER ONU IDENTIFICATION NUMBER DETERMINATION
S4
GRANT TRANSMISSION ORDER DETERMINATION
S5

FIG. 8



09759725.011701

FIG.9

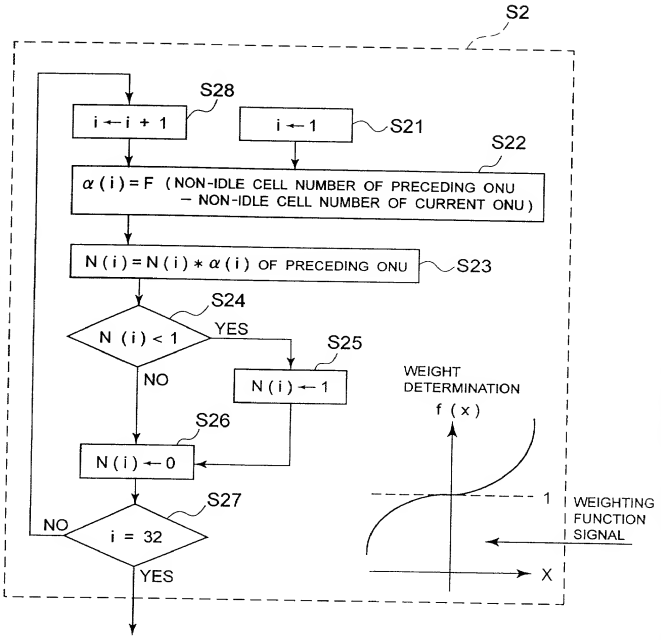

S2
S28
i ← i + 1
i ← 1
S21
S22
α(i) = F (NON-IDLE CELL NUMBER OF PRECEDING ONU − NON-IDLE CELL NUMBER OF CURRENT ONU)
N(i) = N(i) * α(i) OF PRECEDING ONU
S23
S24
N(i) < 1
YES
S25
NO
N(i) ← 1
S26
N(i) ← 0
S27
NO
i = 32
YES
WEIGHT DETERMINATION
f(x)
1
WEIGHTING FUNCTION SIGNAL
X

FIG.10

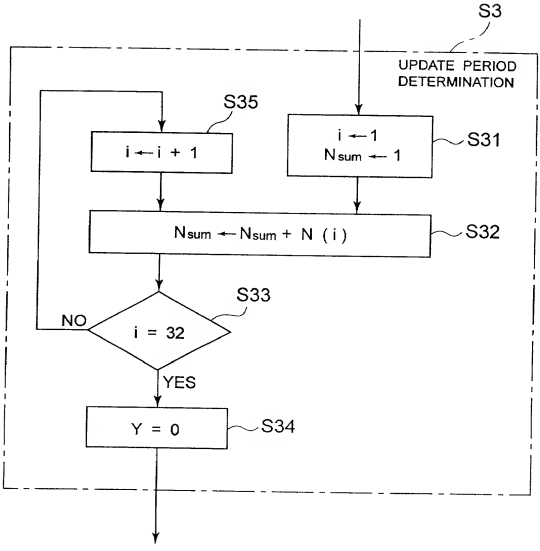

S3
UPDATE PERIOD DETERMINATION
S35
i ← i + 1
i ← 1
Nsum ← 1
S31
Nsum ← Nsum + N (i)
S32
S33
NO
i = 32
YES
Y = 0
S34

FIG.11

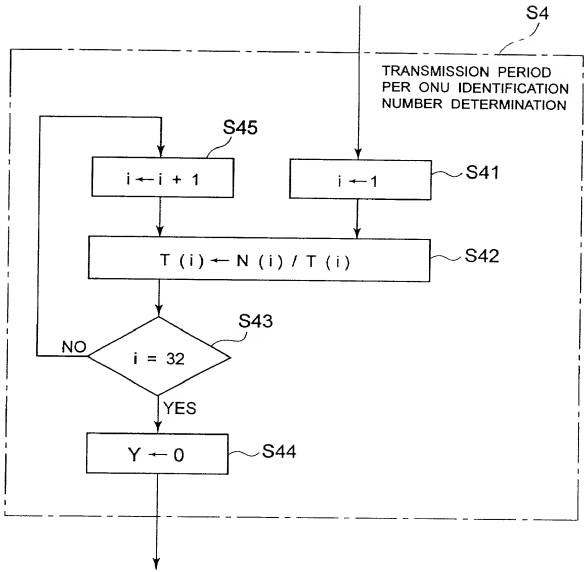
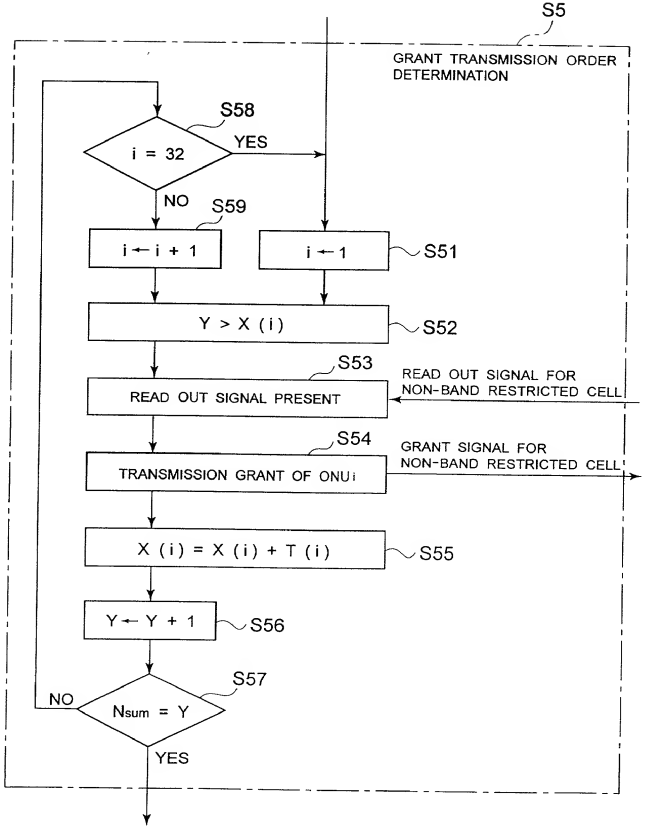

S4
TRANSMISSION PERIOD PER ONU IDENTIFICATION NUMBER DETERMINATION
S45
i ← i + 1
i ← 1
S41
T (i) ← N (i) / T (i)
S42
S43
NO
i = 32
YES
Y ← 0
S44

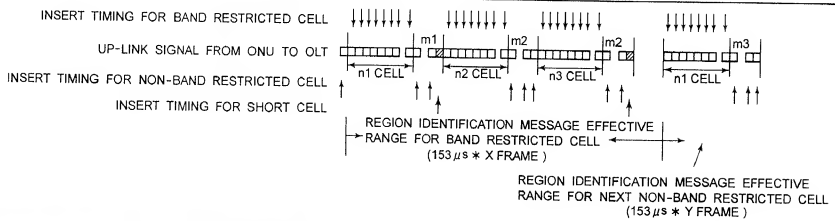
FIG.12


S5
GRANT TRANSMISSION ORDER DETERMINATION
S58
i = 32
YES
NO
S59
i ← i + 1
i ← 1
S51
Y > X (i)
S52
S53
READ OUT SIGNAL PRESENT
READ OUT SIGNAL FOR NON-BAND RESTRICTED CELL
S54
TRANSMISSION GRANT OF ONU i
GRANT SIGNAL FOR NON-BAND RESTRICTED CELL
X (i) = X (i) + T (i)
S55
Y ← Y + 1
S56
S57
NO
Nsum = Y
YES

09760775 '0412701

FIG.13

VENDOR_SPECIFIC MESSAGE		
OCTET	CONTENTS	DESCRIPTION
35	Xxxxxxxx	INDICATES ONU SOURCING THIS MESSAGE
36	01111zzz	MESSAGE INDENTIFICATION "VENDER_SPECIFIC"
37	n1	NUMBER OF REGION FOR BAND RESTRICTED CELL
38	m1	NUMBER OF REGION FOR NON-BAND RESTRICTED CELL
39	n2	NUMBER OF REGION FOR BAND RESTRICTED CELL
40	m2	NUMBER OF REGION FOR NON-BAND RESTRICTED CELL
41	n3	NUMBER OF REGION FOR BAND RESTRICTED CELL
42	m3	NUMBER OF REGION FOR NON-BAND RESTRICTED CELL
43	n4	NUMBER OF REGION FOR BAND RESTRICTED CELL
44	m4	NUMBER OF REGION FOR NON-BAND RESTRICTED CELL
45	00000000	COMMAND REPEATING
46	UNSPECIFIED	



Naoki SAIKUSA
"Pon Transmission System..."
Q62732
Filed January 17, 2001

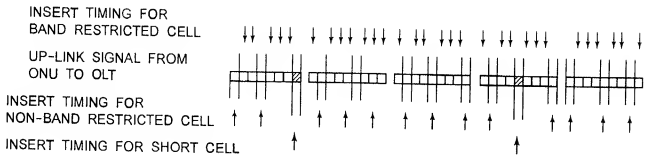
T02TTD' 52209260

FIG.14

GRANT_ALLOCATION MESSAGE		
OCTET	CONTENT	DESCRIPTION
35	PON_ID	DIRECTED MESSAGE TO ONE ONU
36	00001010	MESSAGE IDENTIFICATION "GRANT_ALLOCATION"
37	dddddddd	DATA GRANT ALLOCATED TO THE ONU WITH THIS PON_ID
38	0000000a	a:1 = ACTIVATE DATA GRANT FOR THIS ONU a:0 = DEACTIVATE DATA GRANT FOR THIS ONU
39	pppppppp	PLOAM GRANT ALLOCATED TO THE ONU WITH THIS PON_ID
40	0000000a	a:1 = ACTIVATE PLOAM GRANT FOR THIS ONU a:0 = DEACTIVATE PLOAM GRANT FOR THIS ONU
41	dddddddd	DATA GRANT ALLOCATED TO THE ONU WITH THIS PON_ID
42	0000000a	a:1 = ACTIVATE DATA GRANT FOR THIS ONU a:0 = DEACTIVATE DATA GRANT FOR THIS ONU
43, 46	UNSPECIFIED	

GRANT FOR BAND RESTRICTED CELL

GRANT FOR NON-BAND RESTRICTED CELL



Naoki SAIKUSA
"Pon Transmission System . ."
Q62722
Filed January 17, 2001

09760775 .011701

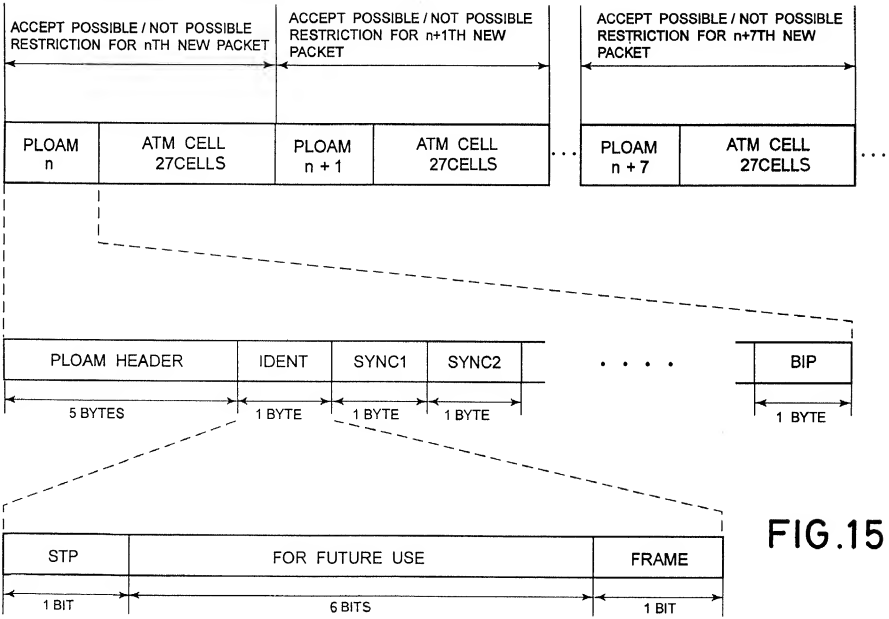
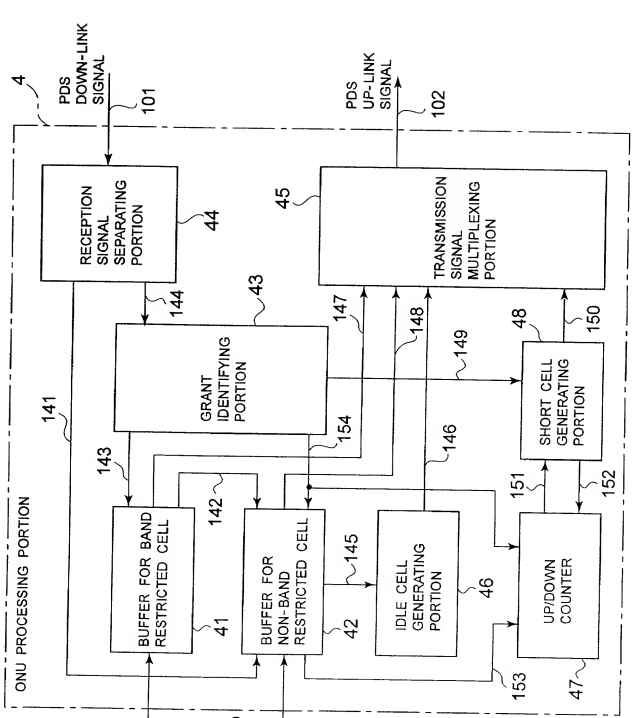


FIG.15

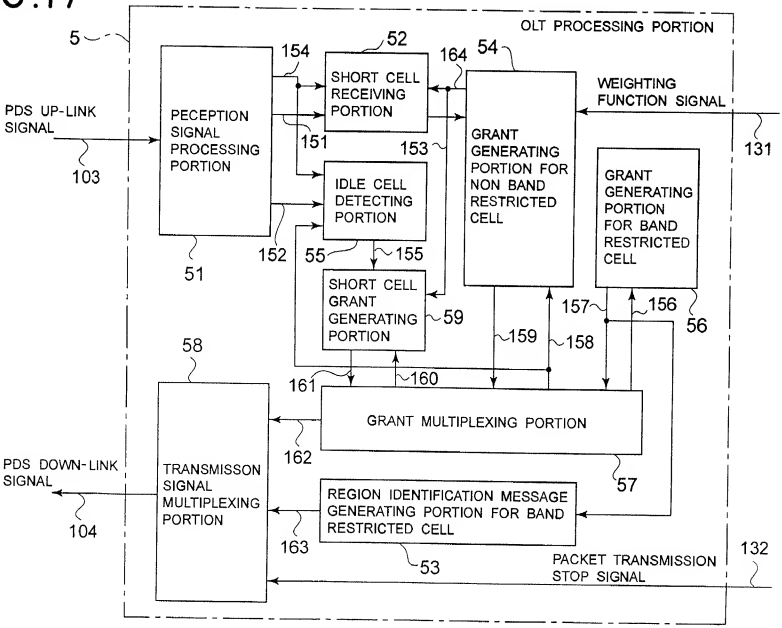
Naoki SAIKUSA
"Pon Transmission System ..."
Q62732
Filed January 17, 2001

FIG.16


4
ONU PROCESSING PORTION
PDS DOWN-LINK SIGNAL
101
PDS UP-LINK SIGNAL
102
INPUT BAND RESTRICTED CELL SIGNAL
111
INPUT NON-BAND RESTRICTED CELL SIGNAL
112
RECEPTION SIGNAL SEPARATING PORTION
44
TRANSMISSION SIGNAL MULTIPLEXING PORTION
45
GRANT IDENTIFYING PORTION
43
BUFFER FOR BAND RESTRICTED CELL
41
BUFFER FOR NON-BAND RESTRICTED CELL
42
IDLE CELL GENERATING PORTION
46
UP/DOWN COUNTER
47
SHORT CELL GENERATING PORTION
48
141
142
143
144
145
146
147
148
149
150
151
152
153
154

09260725 "0127TO

FIG.17



Naoki SAIKUSA
"Pon Transmission System ..."
Q62732
Filed January 17, 2001

FIG.18

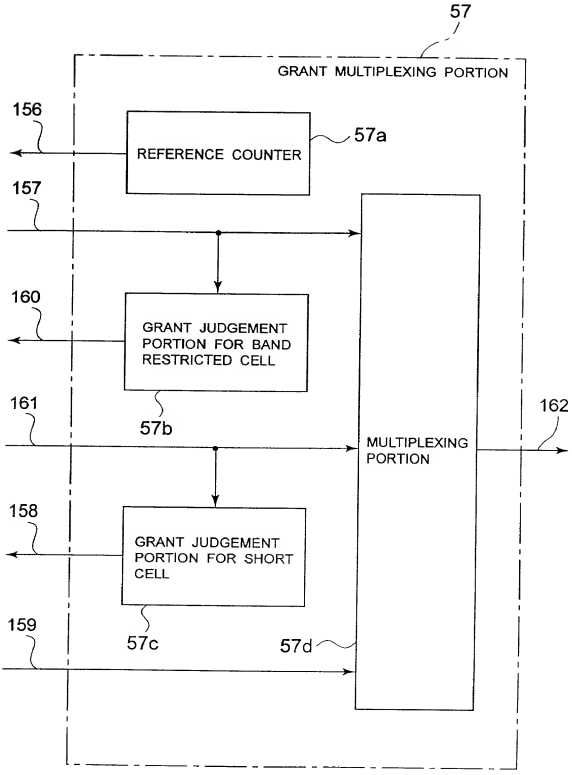

57
GRANT MULTIPLEXING PORTION
156
REFERENCE COUNTER
57a
157
160
GRANT JUDGEMENT PORTION FOR BAND RESTRICTED CELL
161
57b
MULTIPLEXING PORTION
162
158
GRANT JUDGEMENT PORTION FOR SHORT CELL
159
57c
57d

FIG.19

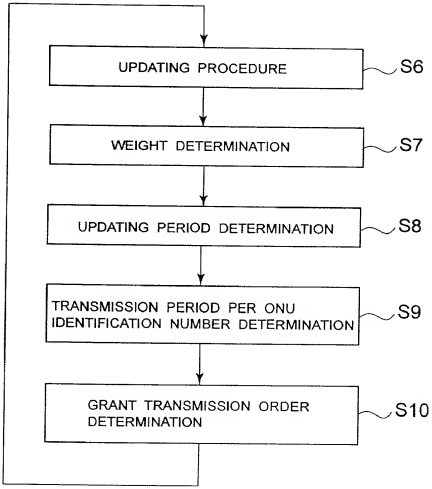

UPDATING PROCEDURE
S6
WEIGHT DETERMINATION
S7
UPDATING PERIOD DETERMINATION
S8
TRANSMISSION PERIOD PER ONU IDENTIFICATION NUMBER DETERMINATION
S9
GRANT TRANSMISSION ORDER DETERMINATION
S10

FIG. 20

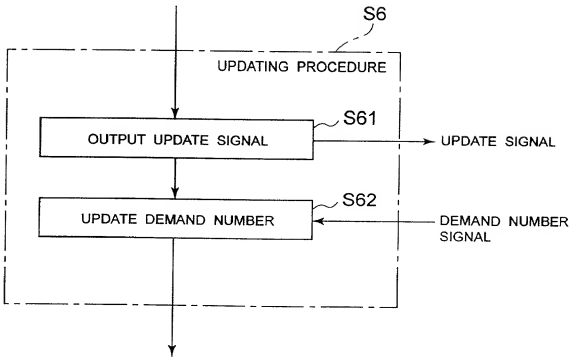

S6
UPDATING PROCEDURE
S61
OUTPUT UPDATE SIGNAL
UPDATE SIGNAL
S62
UPDATE DEMAND NUMBER
DEMAND NUMBER SIGNAL

FIG. 21

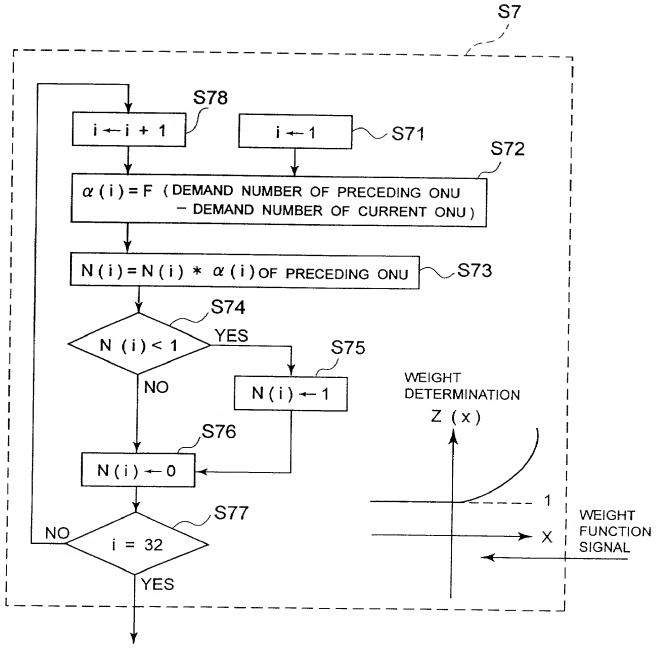

S7
S78
i ← i + 1
i ← 1
S71
S72
α(i) = F (DEMAND NUMBER OF PRECEDING ONU − DEMAND NUMBER OF CURRENT ONU)
N(i) = N(i) * α(i) OF PRECEDING ONU
S73
S74
N(i) < 1
YES
NO
S75
N(i) ← 1
S76
N(i) ← 0
S77
NO
i = 32
YES
WEIGHT DETERMINATION
Z(x)
1
X
WEIGHT FUNCTION SIGNAL

FIG. 22

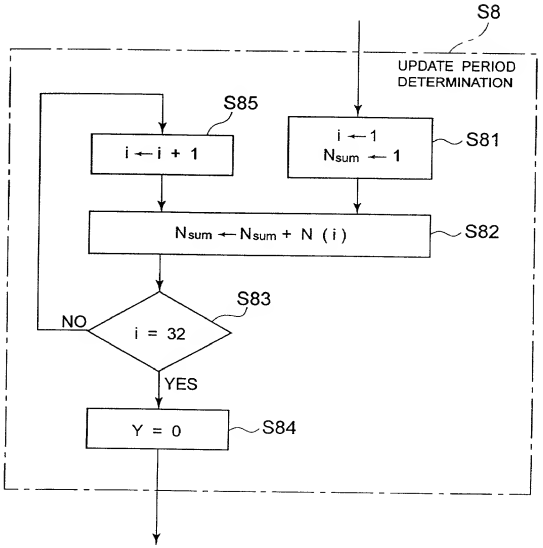

S8
UPDATE PERIOD DETERMINATION
S85
i ← i + 1
i ← 1
Nsum ← 1
S81
Nsum ← Nsum + N (i)
S82
S83
NO
i = 32
YES
Y = 0
S84

FIG. 23

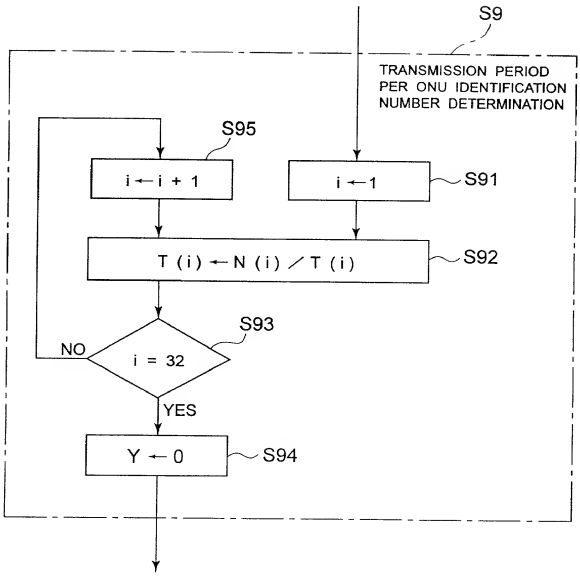
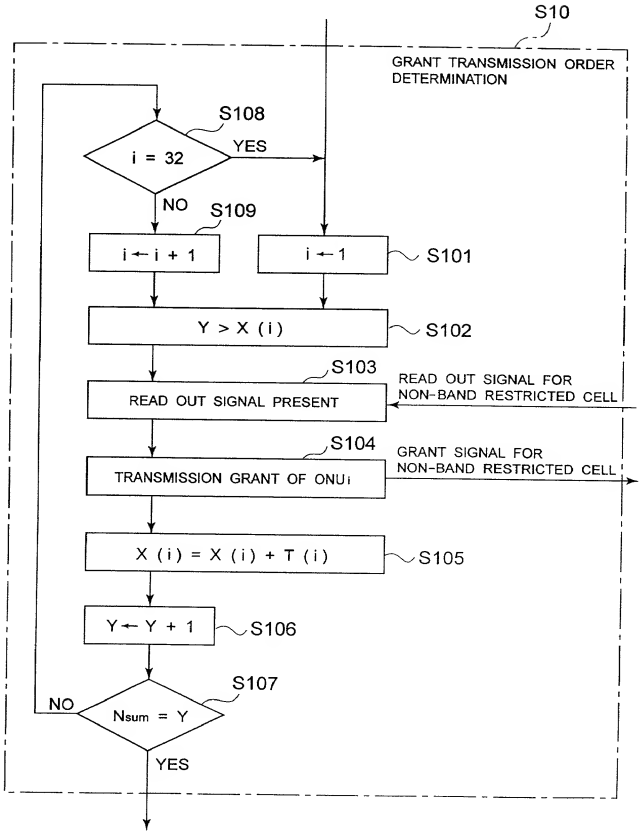

S9
TRANSMISSION PERIOD PER ONU IDENTIFICATION NUMBER DETERMINATION
S95
i ← i + 1
i ← 1
S91
T (i) ← N (i) / T (i)
S92
S93
NO
i = 32
YES
Y ← 0
S94

FIG. 24


S10
GRANT TRANSMISSION ORDER DETERMINATION
S108
i = 32
YES
NO
S109
i ← i + 1
i ← 1
S101
Y > X (i)
S102
S103
READ OUT SIGNAL PRESENT
READ OUT SIGNAL FOR NON-BAND RESTRICTED CELL
S104
TRANSMISSION GRANT OF ONUi
GRANT SIGNAL FOR NON-BAND RESTRICTED CELL
X (i) = X (i) + T (i)
S105
Y ← Y + 1
S106
S107
NO
Nsum = Y
YES

USATTO-5405460

FIG.25

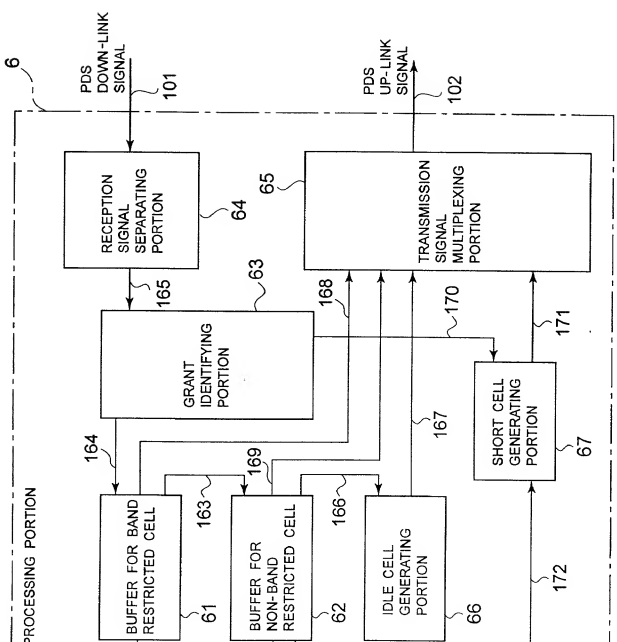
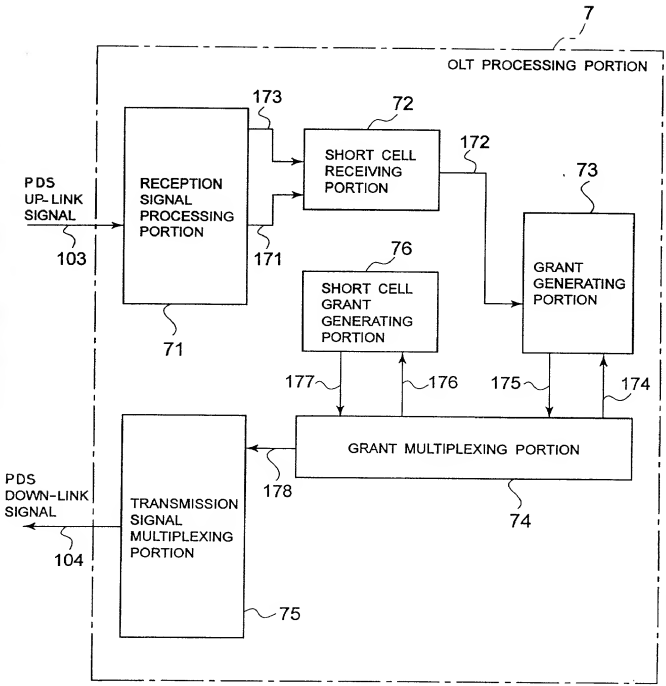


FIG. 26


7
OLT PROCESSING PORTION
173
72
SHORT CELL RECEIVING PORTION
172
73
PDS UP-LINK SIGNAL
RECEPTION SIGNAL PROCESSING PORTION
103
171
76
SHORT CELL GRANT GENERATING PORTION
GRANT GENERATING PORTION
71
177
176
175
174
GRANT MULTIPLEXING PORTION
178
74
PDS DOWN-LINK SIGNAL
TRANSMISSION SIGNAL MULTIPLEXING PORTION
104
75